

WHAT IS CLAIMED IS:

1. A method of determining coating status of a ceramic substrate heater in a processing system, the method comprising:
 - heating the ceramic substrate heater to a desired temperature;
 - exposing the ceramic substrate heater to a reactant gas during a process;
 - monitoring optical emission from the heated ceramic substrate heater to determine coating status of the ceramic substrate heater; and
 - based upon the status from the monitoring, performing one of the following: (a) continuing the exposing and monitoring, and (b) stopping the process.
2. The method according to claim 1, wherein the exposing comprises exposing the ceramic substrate heater to a cleaning gas for removing a material coating from the ceramic substrate heater in a chamber cleaning process.
3. The method according to claim 1, wherein the exposing comprises exposing the ceramic substrate heater to a conditioning gas for forming a material coating on the ceramic substrate heater in a chamber conditioning process.
4. The method according to claim 1, wherein the monitoring comprises detecting infrared optical emission.
5. The method according to claim 1, wherein the monitoring comprises comparing the optical emission intensity to a threshold value, the threshold value being a fixed intensity value or a ratio of the optical emission intensity and an initial optical emission intensity.
6. The method according to claim 1, wherein the performing (b) comprises stopping the process after a threshold value has been reached.

7. The method according to claim 1, wherein the heating comprises heating a ceramic substrate heater supporting a substrate.
8. A method of determining coating status of a ceramic substrate heater in a processing system, the method comprising:
 - determining a threshold value of an optical emission intensity for the ceramic substrate heater;
 - heating the ceramic substrate heater to a desired temperature;
 - exposing the heated ceramic substrate heater to a reactant gas during a process;
 - monitoring a measured value of optical emission from the heated ceramic substrate heater during the process and comparing the measured value to the threshold value to determine coating status of the ceramic substrate heater; and
 - stopping the process when the measured value is approximately equal to the threshold value.
9. The method according to claim 8, wherein determining the threshold value includes determining the optical emission intensity of the ceramic substrate heater having no coating formed thereon, and wherein the exposing comprises exposing the heated ceramic substrate heater having a material coating formed thereon to a cleaning gas for removing the material coating in a chamber cleaning process.
10. The method according to claim 8, wherein determining the threshold value includes determining the optical emission intensity of the ceramic substrate heater having a desired passivating coating formed thereon, and wherein the exposing comprises exposing the heated ceramic substrate heater having no desired passivating coating formed thereon to a reactant gas for forming the desired passivating coating in a chamber conditioning process.

11. A processing system, comprising:
 - a ceramic substrate heater within a process chamber;
 - a gas injection system configured for exposing the ceramic substrate heater to a reactant gas during a process;
 - an optical monitoring system configured for monitoring optical emission from the ceramic substrate heater and to transmit the emission intensity; and
 - a controller configured for receiving the emission intensity to determine coating status of the ceramic substrate heater, and configured for controlling the processing system in response to the status.
12. The processing system according to claim 11, wherein the gas injection system is configured for exposing the ceramic substrate heater to a cleaning gas for removing a material coating from the ceramic substrate heater in a cleaning process.
13. The processing system according to claim 11, wherein the gas injection system is configured for exposing the ceramic substrate heater to a conditioning gas for forming a material coating from the ceramic substrate heater in conditioning process.
14. The processing system according to claim 11, wherein the optical monitoring system comprises a pyrometer for detecting infrared radiation.
15. The processing system according to claim 11, wherein the controller is configured for comparing the optical emission intensity to a threshold value, the threshold value being a fixed intensity value or a ratio of the optical emission intensity and an initial optical emission intensity.
16. The processing system according to claim 15, wherein the controller is further configured for performing one of the following: (a) continuing the exposing and monitoring, and (b) stopping the process.

17. The processing system according to claim 11, wherein the ceramic substrate heater comprises at least one of Al₂O₃, AlN, SiC, BeO and LaB₆.
18. The processing system according to claim 11, wherein the ceramic substrate heater further comprises a material coating containing at least one of a silicon-containing coating, a high-k coating, a metal coating, a metal oxide coating, and a metal nitride coating.
19. The processing system according to claim 11, wherein the ceramic substrate heater supports a substrate.